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EXAMINER	
LESPERANCE, JEAN E	
ART UNIT	**PAPER NUMBER**
2674	

DATE MAILED: 05/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/289,600	YAMAGUCHI ET AL.
	Examiner	Art Unit
	Jean E Lesperance	2674

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 03 February 2005 .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-29,31 and 35-38 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-29,31 and 35-38 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 12 April 1999 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. The Appeal Brief filed on 2/3/2005 is considered and claims 1-29, 31, and 35-38 are pending.

2. The indicated allowability of claims 16, 17, 19, and 20 is withdrawn in view of the newly discovered reference(s) to Hasewaga, Yushiya and Mizutani et al. Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-16, 22, 24-28, 31 and 35-38 are rejected under 35 U.S.C. 103 (a) as being unpatentable over patent # 5,739,808 ("Suga et al.") in view of US Patent # 5,483,634 ("Hasegawa").

Regarding claim 1, Suga et al. teach a display device Fig.1 (34) comprising a plurality of picture elements (Fig.3), each picture element comprising a series of spatially adjacent cells Fig.3 (RGB), each cell emitting light in a same color Fig.3 (RR, GG and BB) and data of one pixel shown in Fig.4 can be displayed in a three-gradation 22 display (level 0 to level 2) (column 4, lines 34-36) corresponding to expressing

tones in three or more levels; and a cell signal generating means Fig.1 (20) which generates, based on a monochromatic image signal indicating an output luminance of each picture element of a monochromatic image, an FLCD interface 10 converts an RGB video signal transmitted from the host computer 20 into a signal for the FLCD Column 3, lines 61-63) corresponding to a cell signal for each spatially adjacent cell of a respective picture element of said display device, said cell signal determining an output tone level of the cell. The prior art does not specifically teach so that an average of the output luminances of all the cells within each respective picture element correspond to an output luminance of the respective picture element. But the prior art does teach when this data is converted into data of 255 by executing a ternary halftone process, since this case corresponds to level 2 of a 3-gradation expression shown in FIG. 5, data is converted into such binary data as the both of two sub-pixels of the binary display device come to be lighted as shown in FIG. 14C (refer to FIG. 14D) (column 5, lines 43-48). Thus, it would have been obvious to a person of ordinary skill in the art to modify when this data is converted into data of 255 by executing a ternary halftone process, since this case corresponds to level 2 of a 3-gradation expression shown in FIG. 5, data is converted into such binary data as the both of two sub-pixels of the binary display device come to be lighted as shown in FIG. 14C (refer to FIG. 14D) to achieve the function of so that an average of the output luminances of all the cells within each respective picture element correspond to an output luminance of the respective picture element. Accordingly, Suga et al. teach all the claimed limitations as recited in claim 1 with the exception of providing wherein each respective picture

element of said display device corresponds to a picture element of said monochromatic image, and wherein the output luminances of the plurality of picture elements of said display device express said monochromatic image. However, Hasegawa teaches the input data is expressed by one color, namely, the case of a monochromatic display, a color image can be also displayed by executing the above processes for each of the input data of three colors of R, G, and B (column 10, lines 30-34). Thus, it would have been obvious to utilize the monochromatic display as taught by Hasegawa in the display control disclosed by Suga et al. because this would provide a display control apparatus and method which can display a moving image of a high picture quality to a display apparatus at a high speed.

Regarding claim 2, Suga et al. teach the cell signal generating means Fig.1 (20) generates cell signals so that the output luminance of cells and frames of the respective picture element of said display device and it is inherent for a picture elements of the FLC panel (34) in a display device to be substantially uniform.

Regarding claim 3, Suga et al. teach the cell signal generating means Fig.1 (20), as shown in FIG. 5 (an image can be displayed with respective three-levels for each of RGB colors) by one pixel in FIG. 3 (original two pixels in the horizontal direction can be used as one pixel) (column 4, lines 36-39) corresponding to generates the output luminance of the cells of the respective element of the display change at the inclination according to the gradient vector of picture elements around the respective picture element corresponding to the cells.

Regarding claim 4, Suga et al. the cell signal generating means Fig.1 (20), as shown in FIG. 5 (an image can be displayed with respective three-levels for each of RGB colors) by one pixel in FIG. 3 (original two pixels in the horizontal direction can be used as one pixel) (where each cell has a tone level which means that they are independent of each other) (column 4, lines 36-39) corresponding to intensity-modulates and time-modulates input signal levels to the respective cells independently of each other.

Regarding claim 5, Suga et al. the cell signal generating means Fig.1 (20), as shown in FIG. 5 (an image can be displayed with respective three-levels for each of RGB colors) by one pixel in FIG. 3 (original two pixels in the horizontal direction can be used as one pixel) (where each cell has a tone level which means that they are independent of each other) (column 4, lines 36-39) corresponding to time-modulates input signal levels to the respective cells independently of each other.

Regarding claim 6, Suga et al. teach the cell signal generating means Fig.1 (20), a frame data read out from the frame memory 102 is multi-value halftone processed by the halftone process unit 103 to become the gradation number which is obtained from the main processing unit 106 (Col.4, lines 60-63) corresponding to time-modulates in put signal levels to the respective cells by frame.

Regarding claim 7, Suga et al. teach the cell signal generating means Fig.1 (20) generates cell signals so that the output luminance of cells and frames of the respective picture element of said display device and it is inherent for a picture elements of the FLC panel (34) in a display device to be substantially uniform.

Regarding claim 8, Suga et al. teach in Fig.4 the pixel with maximum number of tones 256 corresponding to the maximum number of tones which can be expressed by each cell per one frame is not smaller than 64 (6 bits) and 256 (8 bits).

Regarding claim 9, Suga et al. teach FIGS. 14A to 14D are views for explaining the conversion for converting data into the ON/OFF data of the binary display device in a case where the gradation number is 3 as mentioned above. Among the input image data shown in FIG. 14A, the value of the input image data of a pixel x is 200. When this data is converted into data of 255 by executing a ternary halftone process, since this case corresponds to level 2 of a 3 -gradation expression shown in FIG. 5, data is converted into such binary data as the both of two sub-pixels of the binary display device come to be lighted as shown in FIG. 14C (refer to FIG. 14D) (Col.5, Li.38-48) corresponding to a tone number conversion means which carries out a tone number conversion processing on an input original monochromatic image signal, thereby generating said monochromatic image signal, wherein a number of tones represented by said monochromatic image signal is no greater than a number of tones which can be expressed by each respective picture element of said display device.

Regarding claim 10, Suga et al. teach in Fig.4 the pixel with maximum number of tones 256 corresponding to the number of tones represented by the original monochromatic image display is not smaller that 256 (8 bits)

Regarding claim 11, Suga et al. teach an image can be displayed with respective three levels for each RGB colors (column 4, lines 34 and 35) corresponding to the display device expresses each picture element by three pixels.

Regarding claim 12, Hasewaga teaches the input data is expressed by one color, namely, the case of a monochromatic display, a color image can be also displayed by executing the above processes for each of the input data of three colors of R, G, and B (column 10, lines 30-34).

Regarding claim 13, Suga et al. teach a display device Fig.1 (34) comprising a plurality of picture elements (Fig.3), each picture element comprising a series of spatially adjacent cells Fig.3 (RGB), each cell emitting light in a same color Fig.3 (RR, GG and BB) and data of one pixel shown in Fig.4 can be displayed in a three-gradation 22 display (level 0 to level 2) (column 4, lines 34-36) corresponding to expressing tones in three or more levels; and a drive means Fig.1 (20) which drives the cell of the respective element so that output level difference per one level of said three or more levels differs from each other between said at least two of said series of cells (see Fig. 7, a pixel where there are three or more levels and tow are different from each other), an FLCD interface 10 converts an RGB video signal transmitted from the host computer 20 into a signal for the FLCD Column 3, lines 61-63) corresponding to a cell signal for each spatially adjacent cell of a respective picture element of said display device, said cell signal determining an output tone level of the cell.

Regarding claim 14, Suga et al. teach Fig. 7 where two of the cells are the same and the difference level is higher than the next cell corresponding to the maximum output level of one of said at least two cells is substantially the same as the output level difference per one level of the other.

Regarding claim 15, Suga et al. teach the drive means drives the cell Fig.1 (20) and Fig. 7 where two of the cells are the same and the difference level is higher than the next cell corresponding to at least two cells express tones in substantially the same the same number of levels.

Regarding claim 16, Hasewaga teaches the input data is expressed by one color, namely, the case of a monochromatic display, a color image can be also displayed by executing the above processes for each of the input data of three colors of R, G, and B where the display Fig.1 (26) is a FLCD (column 10, lines 30-34) and Fig. 7 where two of the cells are the same and the difference level is higher than the next cell corresponding to at least two cells are different from each other.

Regarding claims 22, Suga et al. teach a fine and excellent displaying can be realized with a large-size screen. By utilizing thus feature, up to today, the FLCD has been widely applied to a display of DTP (desk top publishing) system or the like (Col. 1, Li. 52-5 5) corresponding to the display device is a liquid crystal panel.

Regarding claim 24, Suga et al. teach Fig.4 where there are an M number of cells, there are the L tones expressing the intensity modulation in each cell, excluding the zero tone level (255, 255 and 128), and the zero level (0).

Regarding claim 25, Suga et al. teach Fig.4 where there are an M number of cells, there are the N tones expressing the time modulation in each cell, excluding the zero tone level (255, 255 and 128) and the zero level (0).

Regarding claim 26, Suga et al. teach the cell signal generating means Fig.1 (20), as shown in FIG. 5 (an image can be displayed with respective three-levels for

each of RGB colors) by one pixel in FIG. 3 (original two pixels in the horizontal direction can be used as one pixel) (where each cell has a tone level which means that they are independent of each other) (column 4, lines 36-39) corresponding to intensity-modulates and time-modulates input signal levels to the respective cells independently of each other.

Regarding claim 27, Suga et al. teach Fig.4 where there are an M number of cells, there are the L tones expressing the intensity modulation in each cell, excluding the zero tone level (255, 255 and 128), and the zero level (0).

Regarding claim 28, Suga et al. teach Fig.7, a pixel, where at least two cells of said series of cells have maximum output levels different from each other (255) and said cell signal generating means Fig.1 (20) generates the cell signal for each cell so that the output level difference per one level differs from each other between said at least two of said series of cells.

Regarding claim 31, Suga et al. teach an image can be displayed with respective three-levels for each of RGB colors by one pixel in FIG. 3 (original two pixels in the horizontal direction can be used as one pixel) where it is well known in the art for color display element to be formed of polyethylene terephthalate colored with anthraquinone dye.

Regarding claims 35, Suga et al. teach Fig.6 (original 4 pixels in the horizontal direction and two pixels in the vertical direction can be used as one pixel where at least two cells have the same color blue.

Regarding claim 36, Suga et al. teach Fig.6 (original 4 pixels in the horizontal direction and two pixels in the vertical direction can be used as one pixel where at least two cells have the same color blue.

Regarding claim 37, Suga et al. teach Fig.1 which teach a pixel with 9 different tones has a greater number of tones than said number of tones represented by said monochromatic image signal.

Regarding claim 38, Suga et al. teach a display device Fig.1 (34) comprising a plurality of picture elements (Fig.3), each picture element comprising a series of spatially adjacent cells Fig.3 (RGB), each cell emitting light in a same color Fig.3 (RR, GG and BB) and data of one pixel shown in Fig.4 can be displayed in a three-gradation display (level 0 to level 2) (column 4, lines 34-36) corresponding to expressing tones in three or more levels; and a cell signal generating means Fig.1 (20) which generates, based on a monochromatic image signal indicating an output luminance of each picture element of a monochromatic image, an FLCD interface 10 converts an RGB video signal transmitted from the host computer 20 into a signal for the FLCD Column 3, lines 61-63) corresponding to a cell signal for each spatially adjacent cell of a respective picture element of said display device, said cell signal determining an output tone level of the cell. The prior art does not specifically teach so that an sum of the output luminances of all the cells within each respective picture element correspond to an output luminance of the respective picture element. But the prior art does teach when this data is converted into data of 255 by executing a ternary halftone process, since this case corresponds to level 2 of a 3-gradation expression shown in FIG. 5, data

is converted into such binary data as the both of two sub-pixels of the binary display device come to be lighted as shown in FIG. 14C (refer to FIG. 14D) (column 5, lines 43-48). Thus, it would have been obvious to a person of ordinary skill in the art to modify when this data is converted into data of 255 by executing a ternary halftone process, since this case corresponds to level 2 of a 3-gradation expression shown in FIG. 5, data is converted into such binary data as the both of two sub-pixels of the binary display device come to be lighted as shown in FIG. 14C (refer to FIG. 14D) to achieve the function of so that an sum of the output luminances of all the cells within each respective picture element correspond to an output luminance of the respective picture element. Accordingly, Suga et al. teach all the claimed limitations as recited in claim 1 with the exception of providing wherein each respective picture element of said display device corresponds to a picture element of said monochromatic image, and wherein the output luminances of the plurality of picture elements of said display device express said monochromatic image. However, Hasegawa teaches the input data is expressed by one color, namely, the case of a monochromatic display, a color image can be also displayed by executing the above processes for each of the input data of three colors of R, G, and B (column 10, lines 30-34). Thus, it would have been obvious to utilize the monochromatic display as taught by Hasegawa in the display control disclosed by Suga et al. because this would provide a display control apparatus and method which can display a moving image of a high picture quality to a display apparatus at a high speed.

4. Claim 17 is rejected under 35 U.S.C. 103 (a) as being unpatentable over patent # 5,739,808 ("Suga et al.") in view of US Patent # 5,483,634 ("Hasegawa") in further view of US Patent # 6,326,726 ("Mizutani et al").

Regarding claim 17, Suga et al. teach an FLCD panel which was modified by Hasewaga who teaches the input device data is expressed by one color, namely, the case of a monochromatic display, a color image can be also displayed by executing the above processes for each of the input data of three colors of R, G and B. Accordingly, the prior arts teach all the claimed limitations as recited in claim 17 with the exception of providing an organic EL. Mizutani et al. teach a novel <u>organic</u> electroluminescent display device comprising a transparent supporting substrate (column 4, lines 65 and 66). It would have been obvious to utilize the organic EL as taught by Mizutani et al. in the modified display disclosed by Suga et al and Hasewaga because this would provide a novel organic electroluminescent display device free from the above problem.

5. Claims 18, 19 and 29 are rejected under 35 U.S.C. 103 (a) as being unpatentable over patent # 5,739,808 ("Suga et al.") in view of US Patent # 5,483,634 ("Hasegawa") in further view of US Patent # 5,917,621 ("Yushiya").

Regarding claim 18, Suga et al. teach an FLCD panel which was modified by Hasewaga who teaches the input device data is expressed by one color, namely, the case of a monochromatic display, a color image can be also displayed by executing the above processes for each of the input data of three colors of R, G and B. Accordingly, the prior arts teach all the claimed limitations as recited in claim 18 with the exception of

providing a CIE chromaticity diagram with different coordinates points. However, Yushiya teaches FIG. 5 shows a CIE-xy chromaticity diagram, in which an area surrounded by a solid line, consisting of a spectrum line and a red-purple line, includes all the colors (column 1, lines 60-62) and a picture element by reading an original document, the color of the original is represented by the coordinate of the center of gravity when the r, g, b values are respectively placed at the points R, G, B in FIG. 5. It would have been obvious to utilize the CIE chromaticity as taught by Yushiya in the modified display disclosed by Suga et al and Hasewaga because this would provide an image pickup device capable of image taking of high quality.

Regarding claim 19, Yushiya teaches a substrate Fig.2 (19).

Regarding claim 29, Suga et al. teach an FLCD panel which was modified by Hasewaga who teaches the input device data is expressed by one color, namely, the case of a monochromatic display, a color image can be also displayed by executing the above processes for each of the input data of three colors of R, G and B. Accordingly, the prior arts teach all the claimed limitations as recited in claim 18 with the exception of providing a CIE chromaticity diagram with different coordinates points. However, Yushiya teaches FIG. 5 shows a CIE-xy chromaticity diagram, in which an area surrounded by a solid line, consisting of a spectrum line and a red-purple line, includes all the colors (column 1, lines 60-62) and a picture element by reading an original document, the color of the original is represented by the coordinate of the center of gravity when the r, g, b values are respectively placed at the points R, G, B in FIG. 5. It would have been obvious to utilize the CIE chromaticity as taught by Yushiya in the

modified display disclosed by Suga et al and Hasewaga because this would provide an image pickup device capable of image taking of high quality.

6. Claims 20, 21 and 23 are rejected under 35 U.S.C. 103 (a) as being unpatentable over patent # 5,739,808 ("Suga et al.") in view of US Patent # 5,483,634 ("Hasegawa") in further view of US Patent # 5,917,621 ("Yushiya") in further view of US Patent # 6,326,726 ("Mizutani et al").

Regarding claim 20, Suga et al. teach an area modulation means which control the output luminance of each picture element by selectively turning on and off input signals to respective cell for each picture element Fig.1 (20), a time modulation means which drives the respective cells for each picture element in a time division system Fig.2 (101), an intensity modulation means which controls input signal levels to the respective cells for each picture element independently of each other Fig.1 (20). Accordingly, the prior art teaches all the claimed limitations as recited in claim 20 with the exception of providing the maximum luminance of each picture element. However, Mizutani et al. teach the display shows a desired display pattern of a pixel brightness of 600cd/m-sub-2. It would have been obvious to utilize the pixel brightness as taught by Mizutani et al. in the modified display disclosed by Suga et al. because this would provide a novel organic electroluminescent display device free from the above problem.

Regarding claim 21, Mizutani et al. teach the display shows a desired display pattern of a pixel brightness of 600cd/m-sub-2.

Regarding claim 23, Mizutani et al. teach a novel organic electroluminescent display device comprising a transparent supporting substrate (column 4, lines 65 and 66).

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean Lesperance whose telephone number is (571) 272-7692. The examiner can normally be reached on from Monday to Friday between 10:OOAM and 6:3OPM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard, can be reached on (571) 272-7603.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park 11, 2121 Crystal drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Jean Lesperance

Jean Lay

Date 4/21/2005

Art Unit 2674

Henry N. Tran

HENRY N. TRAN
PRIMARY EXAMINER